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Monetary Policy

A Skeptic's Guide to Canadian Monetary Policy

by

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The uncertain nature of economic knowledge has important consequences for the theory and practice of monetary policy. The Bank of Canada's overly expansionary policies of the early 1970s illustrate the danger of trying to "fine-tune" economic growth. And the failure of monetary gradualism to bring inflation down in second half of that decade provides a lesson in the danger of basing policy solely on control of a single monetary aggregate.

This experience argues in favor of an adaptive policy aimed at keeping the rate of growth of money, broadly defined, on a steady, noninflationary course — a strategy that implies interest-rate and exchange-rate fluctuations larger than those experienced in the past. If the Bank had pursued such a policy in more recent times, it would have allowed interest rates to rise more than they did in the 1987–89 period, and would have allowed a more rapid decline in interest rates during 1990. The result would have been less growth of inflationary pressure during 1987–89, and a less severe recession now.

The uncertainty of economic knowledge also points to the importance of discretion in Bank of Canada actions. Imposing simple rules inevitably will lead to undesired consequences. Furthermore, in the absence of a consensus among Canadians as to the proper conduct of monetary policy, imposing a binding rule on the Bank would amount to giving an entrenched special status to one particular point of view above all others.

Introduction

One of the fascinating aspects of monetary policy is the way it combines theory and practice.* Monetary policy is not just an intellectual exercise conducted in economics classes. The Bank of Canada's actions have concrete effects on real people's lives. To understand these effects and to recommend improvements in monetary policy, however, we must use abstract theory. The Bank of Canada's current policy is based on a theory that less monetary restriction would only produce rising inflation, and every critic of the Bank is relying, at least implicitly, on some contrary theory.

The controversy over monetary policy in Canada today illustrates the general rule that whenever economic theory and policy meet there is disagreement. Generations of economists have contributed to public debate over monetary policy in many different countries, and much of the theory of monetary policy has been shaped by these arguments, as economists have attempted to draw generalizations from particular historical experiences.

A lot of controversy — in Canada in 1990, as in other countries and other times — can be attributed to the conflict between different peoples' interests. But a lot of it also arises from the uncertainty of economic knowledge. There are severe limits on how much anyone understands the inner workings of a complicated economic system such as Canada's. We have many theories with some degree of empirical support, but none is as undeniable as some of the theories found in the more settled parts of the physical sciences. This lack of solidity is why there is room for so much disagreement among economists who have no personal interests at stake other than their professional reputations.

The theme of this presentation is the uncertain nature of economic knowledge and its consequences for the theory of monetary policy. I think some of the biggest mistakes of monetary policy have resulted from paying insufficient attention to this uncertainty, from placing too much credence in theories that looked promising at the time but turned out not to work as planned. Likewise, some of the biggest mistakes of monetary theory have resulted from a neglect of that same uncertainty, from assuming that people's economic behavior is always based on an absolutely correct understanding of how the economic system functions.

Monetary Policy and Inflation

One of the oldest and simplest theories of economics is the quantity theory of money, which asserts that in the long run inflation will occur whenever the central bank allows the supply of money to expand faster than the real demand for money. The real demand for money is simply the amount of purchasing power that people want to hold, on average, in the form of currency and deposits. Over periods of several years, this demand normally grows at about the same rate as the economy's real income. So unless there is an unusually large and prolonged shift in demand, the only way to avoid inflation in the long run is to make the money supply grow at about the same rate as real national income.

The quantity theory is not just one of the oldest and simplest theories in economics; it is also one of the most solidly based on empirical observation. That is why almost all monetary economists now subscribe to it, at least as a long-run proposition. Yet no theory is guaranteed to be correct. It is always conceivable that new observations will refute it or new institutional developments render it obsolete.

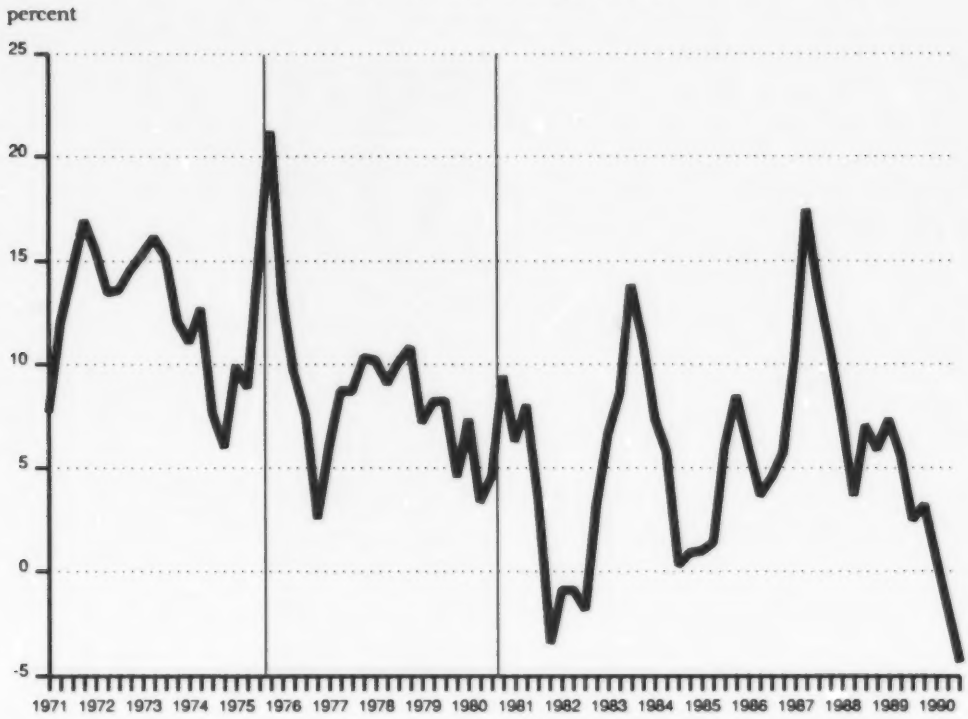
Monetary Gradualism: Failure of the Theory?

In fact, some people think the quantity theory of money failed in Canada in the second half of the 1970s, when the Bank of Canada's policy of monetary gradualism failed to control inflation. Monetary gradualism was supposed to work by gradually reducing the rate of growth of M1, a narrowly defined measure of the money supply that includes only currency

Figure 1

M1 Growth in Canada, 1971–90

(year-over-year percentage change)



Note: The shaded area represents the period from the formal announcement of gradualism to its effective abandonment.
Source: Bank of Canada.

and chartered-bank demand deposits, which for the most part do not yield interest.

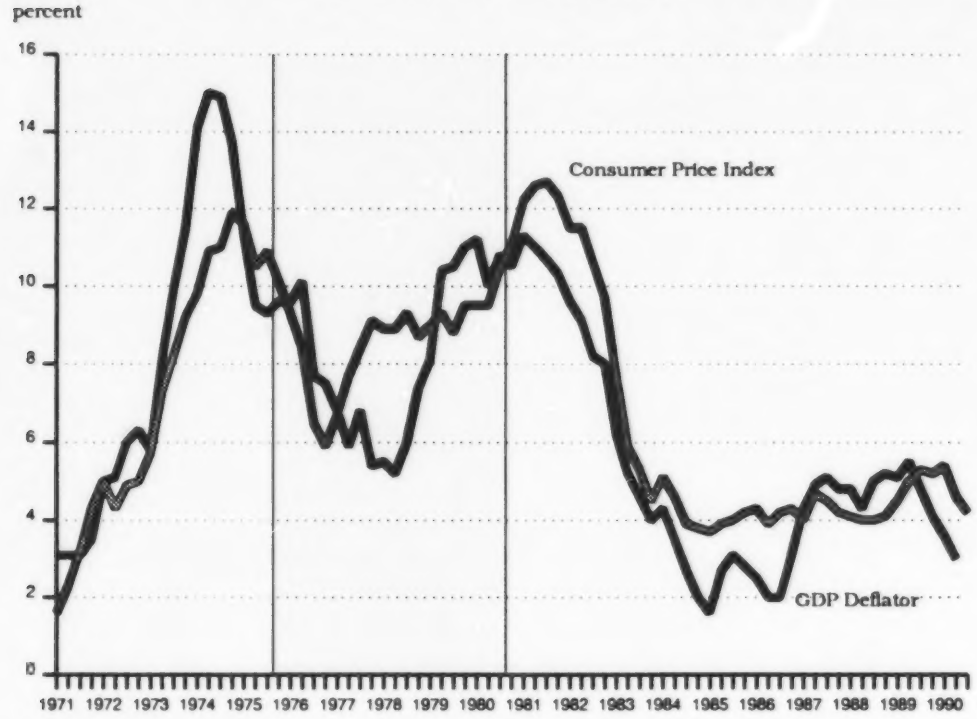
The policy did indeed bring down the growth rate of M1, from 13 percent per year in 1971 through 1975 to 8 percent per year during 1976 through 1980, the first five full calendar years of the policy. By 1980, the rate had fallen to just over 6 percent. The reduction in monetary growth was not smooth and steady (see Figure 1), but it was substantial. Nevertheless, monetary gradualism was not successful in reducing the rate of inflation. The annual rate of change of both the GDP deflator and the consumer price index (CPI) came down somewhat during the first three years of the program, but then they began to rise again (see Figure 2). By 1980, both measures of inflation were about as high as they had been at the outset of monetary gradualism. The GDP deflator showed 10.6 percent inflation in 1980 compared with 10.8 percent in 1975; the CPI indicated 10.0 percent inflation in both years. By 1981, both measures showed even higher inflation than at the outset of the program.

Some of the details of what happened from 1976 through 1980 can be explained by two special factors: the implementation of wage and price controls through the Anti-Inflation Board (AIB) during the first three years of the program; and the approximately 20 percent depreciation of the Canadian dollar that occurred during 1977 and 1978.[1] These phenomena help to explain why inflation fell and then rose during these years. Empirical assessments of the effects of the AIB are somewhat mixed, but most analysts agree that the

Figure 2

Inflation in Canada: The GDP Deflator and the Consumer Price Index, 1971–90

(year-over-year percentage change)



Note: The shaded area represents the period from the formal announcement of gradualism to its effective abandonment.
Source: Statistics Canada.

controls had at least a temporary effect of reducing inflation.[2] The expiration of controls and the currency depreciation both contributed to the resurgence of inflation starting in late 1978.

Nevertheless, if the quantity theory is correct, these special factors cannot explain the overall failure of inflation to come down more than temporarily despite the slower monetary expansion. The burst of inflation following the expiration of AIB controls should have ended as soon as prices registered the inflationary pressures that had previously been suppressed by controls. As for the substantial depreciation, a quantity theorist would argue that such a phenomenon is not an independent causal factor but another manifestation of excess monetary expansion. The fact that depreciation sometimes follows monetary expansion with a long and variable lag helps to explain the erratic timing of the link between monetary expansion and inflation, but over the long run a reduction in monetary expansion should cause a reduction in inflation.

Reliance on an Econometric Relationship

To me, this whole episode illustrates not the failure of the quantity theory but the failure of a much narrower theory that relied too much on a particular econometric relationship. This theory implied that all the Bank of Canada had to do to control inflation was to focus on M1, without worrying about any of the other monetary aggregates, which include a broader

range of deposits with the chartered banks and other financial intermediaries. The theory turned out not to work as planned.

What happened was that the Bank estimated an M1 demand function with remarkably good econometric properties, one that seemed to show that almost all of the variation in the real demand for M1 could be explained by variations in real income and short-term interest rates.[3] The apparent stability of this empirical relationship persuaded the Bank that there was little danger of unexpected and unusually large shifts in the demand for M1. Hence it could proceed to control inflation by controlling the expansion of M1 without worrying much about the other aggregates.

Another factor influenced the Bank's choices. It was worried that in controlling the rate of monetary expansion, it might create large fluctuations in interest rates. By focusing on M1, the Bank thought it might avoid the problem. Because the assets included in that aggregate are mostly noninterest bearing, the demand for it is highly sensitive to changes in the level of interest rates; therefore, the Bank saw that it could stabilize M1 growth with relatively small fluctuations in interest rates.

In the fall of 1975, the Bank publicly committed itself to target growth rates for M1. Unfortunately, the econometric relationship that this monetary gradualism was based on began to break down shortly thereafter. The size of the breakdown was substantial. According to one estimate, demand for M1 shifted downward by 5 to 8 percent in 1976, immediately after the policy of gradualism was put in place; by 1981, after the policy had been effectively abandoned, the cumulative downward shift amounted to at least 28 percent.[4]

This shift was associated with the introduction by chartered banks of daily interest accounts and corporate cash-management packages, which had the effect of reducing the public's demand for M1. The high interest sensitivity of the demand for M1, which the Bank had found so attractive, also slowed down the growth of M1 demand, because this period was a time of rising nominal interest rates in the world economy. For both these reasons — the shift in the demand function and the rise in nominal interest rates — the real demand for M1 was slowing down about as fast as the supply by the end of the 1970s. This slowing of demand took all the bite out of monetary gradualism.

As it turned out, M1 was the only one of the many recorded monetary aggregates whose rate of expansion was brought down under monetary gradualism. All the other aggregates were growing about as rapidly in 1980, after five years of the policy, as they had been at the outset. Figure 3 shows the behavior of the rate of growth of M2, which is M1 plus chartered bank time deposits and personal term deposits, and M3, which is M2 plus nonpersonal term deposits. All the other broad aggregates displayed a similar pattern.[5] The factors that had been reducing the real demand for M1 were apparently not having the same effect on the broader aggregates.

Now, it did not take the Bank long to see that there was a problem with its chosen aggregate. Statements made by the Bank suggest that it was reconsidering its policy as early as the first quarter of 1978.[6] Meanwhile, it had publicly committed itself to target growth rates for M1, and another two or three years passed before it was able to extricate itself from that commitment. By 1980, the public's growing impatience with inflation had made it too late for gradualism, and the Bank applied a more drastic policy. That started to take effect just as the worldwide recession started in 1981, and it helped to make the recession more severe in Canada than in any other country of the Organisation for Economic Co-operation and Development.

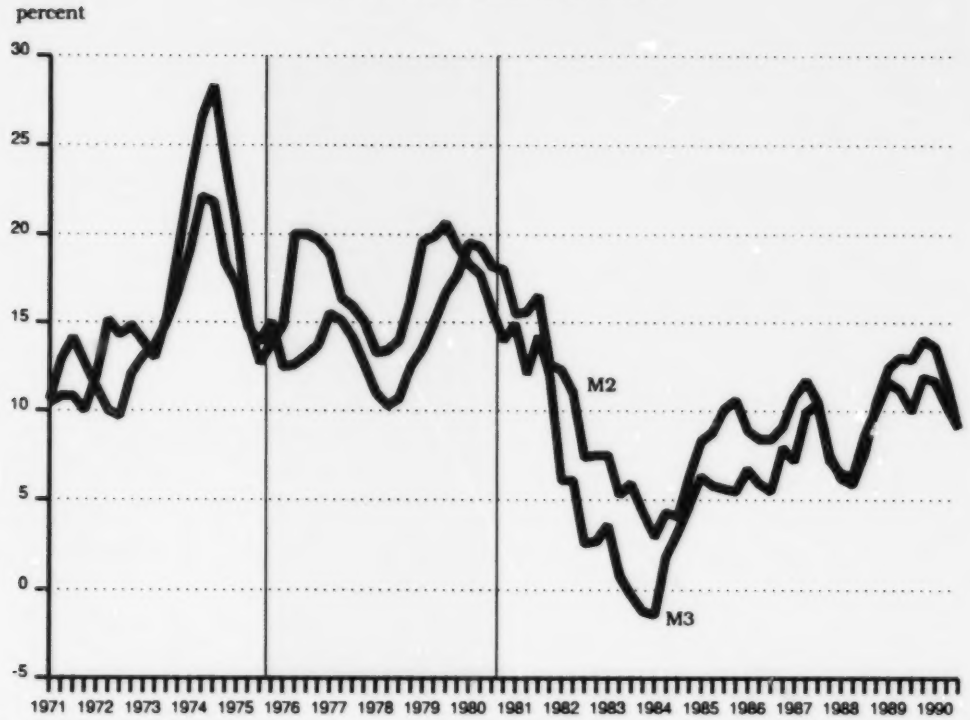
Why Did the Equation Break Down?

Analysts have two possible interpretations of the breakdown of the Bank's estimated demand function for M1. The first is that the changes in banking accounts and services were consequences of exogenous changes in computer technology that made the new ac-

Figure 3

M2 and M3 Growth in Canada, 1971–90

(year-over-year percentage change)



Note: The shaded area represents the period from the formal announcement of gradualism to its effective abandonment.
Source: Bank of Canada.

counts and services technologically feasible at the time.[7] Putting the matter this way makes it look as if the changes were not only inevitable but unforeseeable. That statement is correct, given the current state of economic knowledge. It must be remembered, however, that one of the goals of economic theory is to explain, perhaps even to predict, the evolution of institutions and technology. The fact that major institutional changes frequently require economic theories to be modified shows the fragility of those theories.

The other interpretation is that the breakdown was induced by the very policy of monetary gradualism, which was relying on the equation not to break down. In this view, the failure of the Bank policy was an example of the theoretical proposition known as the Lucas critique which asserts that econometric relationships estimated from past data tend to vanish as soon as policy tries to take advantage of them.[8] So, for example, Courchene has advanced the hypothesis that monetary gradualism gave chartered banks an incentive to use the new computer technology when they did, not just in response to competition from trust companies, which had already introduced daily interest accounts, but also in order to switch customers out of M1 accounts in an effort to beat the target growth rates.[9]

Even if Courchene is wrong about the chartered banks' motivation, one can think of many other reasons why a short-run money-demand equation would begin to break down soon after implementation of a major change in monetary policy. Such a simple equation is

at best a reduced-form relationship illustrating how real money balances, real income, and the level of nominal interest rates are related in normal times. When a policy change on the scale of monetary gradualism is implemented, times are no longer normal. Even if the long-run relationship among these variables is unaffected, there may well be an extended period of adjustment to the new policy during which the relationship appears to break down.[10]

Whether the Canadian breakdown of the estimated demand function for M1 was exogenous or policy induced, the episode illustrates the importance for monetary policy of taking into account the uncertain nature of economic knowledge. It is dangerous to rely uncritically on narrow theories and simple formulas in an uncertain world. If the Bank had been more skeptical in 1975, it would not have staked its credibility on some brittle economic theory. As soon as it saw that M1 was the only aggregate slowing down as planned, it could have adopted a more restrictive policy rather than wasting time trying to extricate itself from its commitment to M1; there might still have been time for gradualist policies.

As for the quantity theory of money, the episode, far from refuting the theory, constitutes yet more evidence in support. Inflation did not come down until growth of the broad monetary aggregates was finally slowed by the sudden restraint applied in 1980 and 1981. David Laidler and Bill Robson have recently shown that there is a close connection between excess M1 growth and subsequent inflation, provided one averages the data over periods of several years.[11] Their evidence suggests that instability in the demand for M1 is not so great as to undermine the basic long-run relationships predicted by the quantity theory, even if it can undermine an insufficiently skeptical monetary policy.[12]

Money and the Business Cycle

Let us turn from inflation to the business cycle. Although this area is one of considerable disagreement among economists, most take the view that monetary policy should be directed toward stabilizing the cycle, that the central bank should try to moderate the associated fluctuations in output and employment. I share that view, but I emphasize the importance of being skeptical of ambitious stabilization schemes that pay too little attention to the uncertainty of economic knowledge. I also argue that consideration of this uncertainty tends to favor the kind of policy that Milton Friedman has long advocated — namely, that of keeping the money supply growing at a steady rate.

Fine Tuning

A lot of formal theorizing about monetary policy portrays the central bank as possessing the skills and the knowledge needed to make fine adjustments to the level of activity in the economy, in response to every change in statistical readings on the state of the economy.[13] Monetary policy is modeled as a problem in control theory, much like the problem faced by rocket scientists making midcourse corrections to a space vehicle that is continually knocked about by unexpected events. Because this way of modeling monetary policy uses the powerful theory of decision making under uncertainty, it can provide illuminating insights into how policy might work under hypothetical circumstances. The actual circumstances of monetary policy are, however, quite different from what the theory assumes.

In particular, the fine-tuning theory presumes that the Bank of Canada has a reliable model of how the economy will respond to its interventions. As economists such as Karl Brunner have emphasized, such models do not exist.[14] Although the Bank does have a large-scale econometric model of the Canadian economy, it is, like all other such models, only as good as the theory that goes into it. And although we know a lot about long-run general trends in macroeconomics, the short-run timing relationships involved in the application of stabilization policy are not well understood at all. Large-scale econometric models are prone

to error, especially at key turning points, because to a large extent they are based not on a detailed understanding of the economy but on the extrapolation of recent trends. The unreliability of such models is evident in the fact that no one trusts them enough to use them without adding a lot of subjective or "judgmental" factors.

The scientific image of the Bank of Canada is also hard to reconcile with its inability to control inflation with monetary gradualism because of shifts in the demand for M1 that it failed to foresee and because of the unforeseen consequences of the high interest sensitivity that had attracted the Bank to the policy in the first place. Moreover, there is the fact, now acknowledged by the Bank, that during the early 1970s it inadvertently fueled inflation by stimulating the economy under a mistaken belief that the actual rate of unemployment was well above its "natural" rate.[15] What was involved was more than the difficulty of knowing the state of the economy at a particular time. Everyone knew the actual rate of unemployment. What the Bank did not know was a property of the economic system it was trying to control: namely, the rate of unemployment that would be sustainable in the long run.

In view of these awkward facts, the Bank has for a long time been trying to avoid being seen as the controller of the business cycle. I think it is wise to do so. It would face an insoluble dilemma if it were to take on the task of controlling a system that no one knows how to control. Unfortunately, the Bank still faces a dilemma. It must follow *some* policy, and whatever that policy is, it will probably affect the course of the business cycle for better or for worse. The Bank somehow has to try to take these effects into account.

In my opinion this dilemma calls for an incrementalist, adaptive approach to monetary policy, rather than the approach of global optimization that has become standard in the formal literature on monetary policy. The problem should be seen as one of groping toward a better policy, rather than computing the best of all possible policies. We need to make use of the few facts we do know, rather than relying on someone's purported model of the entire economic system. We need to focus more on learning from past mistakes and less on predicting the future.

The Problem of Procyclical Monetary Policy

The biggest mistake the Bank has made with respect to the business cycle has been that of following a procyclical monetary policy. That is, there has been a regular tendency for the money supply to grow faster during the expansion phases of the business cycle than during contractions. An extreme example was provided by the 1981–82 recession, which was accompanied by the sharp decline in the growth rates of the broad monetary aggregates illustrated in Figure 3.

The reason the Bank has followed a procyclical monetary policy is not hard to understand. Consider, for example, what happens during a cyclical downturn in economic activity. People cut back on spending plans, thereby cutting back on the demand for credit to finance spending. Furthermore, the fact that a recession worsens the financial position of many borrowers makes banks regard them as less creditworthy than before. Thus, the effective demand for credit — that is, the demand by borrowers regarded as creditworthy — would tend to fall even if no individual borrower's demands changed. Because of these reductions in demand, chartered banks tend to make fewer new loans when a cyclical downturn occurs. Thus, they create fewer new bank deposits, and hence the rate of monetary expansion tends to fall. For analogous reasons, during the expansion phase of the cycle the effective demand for credit tends to grow more rapidly, and hence so does the money supply.

Now the fact that the growth of credit demand is procyclical does not automatically make the rate of monetary expansion procyclical. If, during a cyclical downturn, the Bank of Canada took steps to ensure that the chartered banks were supplied with enough re-

serves to continue creating new deposits at an unchanged rate, then the fall in effective demand for loans would result in an excess supply of loanable funds. Competition among potential lenders would drive interest rates down to the point at which people were persuaded not to cut back by as much in their planned borrowing and spending, and monetary expansion might continue at an unchanged rate.

This scenario is not in fact what tends to happen. Although interest rates are to some extent procyclical, they do not fall enough in the contraction phase of the business cycle to keep the rate of monetary expansion from falling. The reason is that the Bank has always been concerned, to a varying degree, about maintaining orderly financial markets. That is, the Bank attaches great importance to avoiding large fluctuations in interest rates and exchange rates. As we have seen, such a concern was one of the major considerations behind the Bank's decision to focus its efforts on the narrow M1 aggregate under monetary gradualism. Another, more recent example of this motivation was the Bank's January 1990 retreat from its move toward monetary ease after the Canadian dollar fell by more than three cents relative to the U.S. dollar following a mere 29 basis-point reduction in the Bank Rate. Because of its concern for orderly financial markets, the Bank has not allowed interest rates to fall by enough during cyclical downturns to prevent the rate of monetary expansion from falling.

If this analysis of the reasons behind the Bank's procyclical monetary policy is correct, then the positive correlation between the business cycle and the rate of monetary expansion in Canada reflects causation going from economic conditions to monetary expansion. But this analysis does not rule out causation going in the other direction as well. In fact, almost all economic theories imply that reduced monetary expansion will make a cyclical downturn in economic activity more severe than it would otherwise be. Thus, the Bank's procyclical monetary policy almost certainly amplifies business cycle fluctuations. This is why I have long argued that the Bank should concentrate on the humble task of trying to keep the money supply growing at a steady, noninflationary rate.

I support such a policy despite countless theoretical demonstrations that it would be suboptimal, that an optimal monetary policy would not keep the rate of monetary expansion constant but would allow feedback from information on the state of the economy. The problem with all such demonstrations is that they are conditional on having an exact model of the economy. Since there is no such model, the demonstrations do not really prove that the supposedly optimal feedback rule would do more good than harm. Of course, it is also true that in the absence of any exact model I cannot demonstrate the optimality of my proposal. I can argue, however, that if the Bank were to accomplish the task of smoothing out fluctuations in the rate of monetary expansion, it would not be doing as much to aggravate the business cycle as it has in the past.

The Role of Interest Rates and Exchange Rates

A policy of aiming for a steady rate of monetary expansion may seem like a conservative, do-nothing approach. That impression is misleading. Such a policy would not amount to putting the economy on some kind of automatic pilot. The experience with monetary gradualism shows that the Bank would have to focus on more than controlling the growth rate of M1, and there is no automatic formula that can be relied upon to control the growth of any of the broad monetary aggregates in precise fashion from month to month or even from quarter to quarter. Thus, the Bank would have to exercise considerable skill to ensure that the total supply of bank deposits did not grow too fast or too slowly for extended periods.

In a sense, focusing on the relatively modest task of controlling the rate of monetary expansion would require the Bank to engage in a kind of fine tuning, as it would if it were

trying to control the business cycle. Yet fine tuning the money supply has much more hope of success than fine tuning the business cycle, for at least two reasons. First, there is a much more direct and understandable link between the Bank's actions and the rate of monetary expansion than there is between those same actions and the business cycle. The Bank acts directly on the reserves of the chartered banks that create most of the money, and it has a considerable influence on interest rates, which regulate the demand for credit at the root of monetary expansion. Second, the Bank gets weekly readings on the rate of monetary expansion, whereas the information it gets on the state of the business cycle is much less timely.

There is another, more fundamental sense in which aiming for a steady rate of monetary expansion is not a conservative policy. Whether you regard a policy as active or passive depends on your point of view. Most people tend to think of monetary policy not in terms of monetary expansion but in terms of interest rates and exchange rates. In those terms, keeping a steady rate of monetary expansion would be a very active policy indeed. It would entail much larger fluctuations in interest rates and exchange rates than we have been accustomed to. This last point is worth expanding because it is important to understand the role that interest rates and exchange rates play in a market economy and why considerations of uncertainty should make a central bank willing to tolerate large fluctuations in these rates.

Fluctuating Interest and Exchange Rates

That a stable rate of monetary expansion should lead to larger fluctuations in interest rates is implicit in the preceding analysis of the reasons for the Bank's procyclical monetary policy. Consider, for example, what happened in Canada from 1987 through 1989, a period of rapid economic growth. Demands for credit, by businesses, households, and governments were inducing the banking sector to expand rapidly, putting upward pressure on the rate of monetary expansion. In an attempt to restrain the increased demand for credit, the Bank allowed interest rates to rise. The 90-day corporate paper rate, for example, went from 7.4 percent at the beginning of 1987 to 12.4 percent by the end of 1989. Despite these efforts, M2 grew at an average annual rate of 10.3 percent over the period, after having been at less than 10 percent for five calendar years in a row.[16] The other broad aggregates behaved similarly. The point is that in order to contain that burst of monetary expansion, the Bank would have had to allow interest rates to rise by even more than they did.

Since the start of 1990, the situation has changed, but the principle remains. Expansion of the broad monetary aggregates almost came to a stop in the second quarter of the year: M2, for example, grew at only a 3.9 percent annual rate in the second quarter and at a 2.7 percent annual rate in the third quarter. The growth of M1 has been negative in each of the first three quarters this year. If the Bank had been concentrating more on maintaining a stable rate of monetary expansion, it would have allowed interest rates to fall much more rapidly than has been the case for the past several months. If it had done so, our current recession would also have been less severe — if it had taken place at all — because aggregate demand, particularly for durable goods and housing, would not have fallen as much as it has. Any fall in the value of the Canadian dollar triggered by such a decline in interest rates would also have helped mitigate the recession by stimulating net foreign demand for Canadian output.

The general point is that interest rates and exchange rates can play an important stabilizing role in a market economy, rising to choke off inflationary increases in the demand for goods and services and falling to encourage demand when a recession threatens. A policy of stabilizing the rate of monetary expansion would bring these stabilizing market forces more into play.

It follows that a policy of stabilizing the rate of monetary expansion would require the Bank to pay less attention than it has to its traditional objective of orderly financial markets. Stable interest rates and exchange rates may serve some useful purpose in view of the effect that volatile exchange rates can have on the path of inflation. Yet orderly financial markets can be achieved only at the expense of disorderly real markets — markets with excessive fluctuations in output and employment. Furthermore, even if a policy of stabilizing the rate of monetary expansion created much more exchange-rate volatility, the consequences for inflation would be self-limiting. Inflation will never develop into a long-run problem if monetary expansion is kept under control.

It is important to realize that no one knows how much interest rates and exchange rates would have to fall in Canada to keep M2 growing at, say, a 6 to 8 percent annual rate for the next six months. A lot would depend upon exchange-rate expectations which are extremely volatile and unpredictable. It is certainly possible that most of the effects of a revival in monetary expansion would come out in the form of currency depreciation and that international investors' fear of further depreciation would keep Canadian short-term interest rates from falling by more than one or two percentage points, as they demanded a substantial premium over U.S. rates for keeping their capital in Canadian assets. On the other hand, investors have been rather bullish on the Canadian dollar lately, so the Bank might have a lot of room to reduce Canadian interest rates with little effect on the foreign-exchange market.

It is this very uncertainty — the fact that no one knows what combination of interest rates and exchange rates will be compatible with a steady rate of monetary expansion — that makes it important for a central bank to allow these rates to fluctuate widely. For a central bank to keep interest rates within a narrow band, it would have to know what level of these rates was sustainable in the long run, given the economy's real underlying structure. To use Wicksell's phrase, it would have to know the economy's natural rate of interest.[17] In fact, no one knows the natural rate of interest, any more than the natural rate of unemployment, so mistakes inevitably would occur.

Furthermore, these mistakes would not be self-limiting. Indeed, they would be likely to cumulate. For example, if interest rates were kept too low, as they were for some time in Canada in the 1970s, excess demand for goods and services would create inflationary pressures. When people started to experience higher inflation, they would sooner or later come to expect higher inflation. Then an unchanging level of nominal interest rates would imply a lower level of real interest rates, inducing people to spend even more and thus amplifying the inflationary pressure. In this way inflation would continue to feed on itself until eventually the need to include an additional inflation premium brought interest rates up even further than they would otherwise have had to be raised.

Uncertainty and Theory

This analysis illustrates the danger of ignoring uncertainty in the conduct of monetary policy. It also illustrates the danger of ignoring uncertainty in the theory of monetary policy. That is, it illustrates the danger of uncritically assuming that people always act on the basis of what have come to be known as rational expectations — expectations based on a correct understanding of the economic system.

To be more specific, it is a well-established theoretical proposition that if people had rational expectations, even the most extreme form of interest stabilization would be feasible; there would be no danger of an inflationary spiral.[18] When the central bank decided to stabilize interest rates at a lower level, it would just have to announce simultaneously that it was going to reduce the rate of monetary expansion. People would rationally expect the reduced monetary expansion to generate reduced inflation. According to this theory, the

fall in expected inflation could just offset the fall in nominal interest rates, keeping real interest rates at their equilibrium levels, so the excess demand that might start an inflationary spiral would never arise in the first place.

The problem with this rational expectations analysis is that people are not likely to reduce their expectations of inflation just because the Bank of Canada announces a new policy. That theory was tried under monetary gradualism and it did not work; the publicly announced M1 targets did not have any perceivable effect on expected inflation. When forecasting inflation, people tend to look at the recent experience of inflation, rather than trying to predict the consequences of the Bank 's announced policies.[19] If the Bank tries to keep interest rates too low, what people experience is more inflation, not less.

The theory of rational expectations has led to many important insights, among them the Lucas critique I referred to earlier. But it only works when the behavior it predicts coincides with the behavior that experience teaches people to adopt. This identity is not likely to occur if the central bank tries to exercise tight control over interest rates.[20] Any theory that fails to take into account this severe limitation of the concept of rational expectations is likely to be seriously misleading.

The Political Dimension of Monetary Policy

Recognition of the uncertain nature of macroeconomic knowledge has led such notable scholars as Karl Brunner to advocate that monetary policy be conducted according to a fixed rule, one that allows little room for discretion on the part of the policy authorities.[21] So, for example, the *Bank of Canada Act* might be amended to require the Bank to keep the money supply growing at some fixed percentage rate every quarter or by some fixed proportion of the amount by which nominal GNP deviates from some reference path. Another example of a fixed rule would be a law putting the country on a fixed exchange rate — or even on a gold standard or other commodity standard — which would require the Bank to maintain convertibility of the currency at a fixed rate.

Brunner's argument is that such rules, by limiting discretion, would limit the amount of damage that could be done by central bankers with an unjustifiable confidence in their ability to control the economy. He also argues that fixed rules would make economic life more predictable because policy would no longer be subject to the sudden shifts that occur when a discretionary authority has a change of mind.

My own analysis of the issue of rules versus discretion in monetary policy starts from the same premise as Brunner's: namely, that no one knows how to control the economic system. Yet my conclusion is opposite to his. In my opinion, imposing much tighter rules on the conduct of monetary policy would create even bigger dangers than the present discretionary arrangement does.

My argument has two parts. One concerns the practical consequences of imposing rules in the face of uncertainty, and the other the undemocratic nature of imposing rules in an area where no consensus exists.

Uncertainty and Flexibility

To see my first point, consider that where there is uncertainty, there is a need for flexibility, a need to keep options open for when new information arises. A fixed rule would destroy that flexibility. Just as no one knows how to control the economic system, so also no one knows how to design a rule guaranteed to work. The difference is that when some unexpected problem shows up with a fixed rule you are stuck with it.

Suppose, for example, a rule had been imposed on the Bank in 1975. It would have seemed reasonable to many economists at the time to specify a rule much like the M1-control rule that the Bank adopted under monetary gradualism.[22] When it became evident that the rule was not working, the problems that we

faced would surely have been even worse if the *Bank of Canada Act* had had to be amended in order to change the rule. At best, instead of the unpredictable shifts in discretionary policy that advocates of rules complain of, we would have had unpredictable changes in rules.

For another example, consider the recent proposals of a fixed exchange rate with the U.S. dollar. If we had such a rule and inflation started rising in the United States (perhaps as a consequence of its inability to deal with its deficits), the Bank of Canada would be forced to increase the rate of monetary expansion so as to ensure that the value of the Canadian dollar fell with that of the U.S. dollar. Canada would end up importing inflation from the United States.

Of course, we could always abandon the fixed exchange rate in that event. The point is that to keep that option open is to leave room for discretion and hence to create uncertainty — uncertainty of a sudden devaluation or reevaluation. The only way to have a really fixed exchange rate would be to abandon an independent Canadian currency and make the U.S. dollar the only legal tender of Canada. Then we would really be giving up a lot of options.

It is worth noting the distinction between legislative or constitutional rules on the one hand and administrative rules on the other. The debate over rules versus discretion in monetary policy concerns the former, not the latter. None of my objections to legislative rules applies to administrative rules, which can be changed much more easily. In fact, the policy that I advocate, of aiming for a steady rate of monetary expansion, can be seen as an example of an administrative rule. A rule of this kind can be very useful in keeping the central bank on a smooth noninflationary course. It can also be useful as a means of letting people know what the central bank is trying to accomplish in concrete terms, and avoiding some unnecessary and costly uncertainty. One of the most important problems facing a central bank is how to announce and carry out such an administrative rule without giving up its flexibility. Making the rule legislative or constitutional would just aggravate the problem.

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Uncertainty and Democracy

The second part of my argument against rules is one that I think illustrates better than anything the importance of recognizing the uncertain nature of economic knowledge.[23] As a way of introducing it, I draw your attention to an influential line of argument in favor of rules that was put forward by Henry Simons of the University of Chicago in the 1930s and 1940s.[24] Simons argued that the more we are subjected to the arbitrary decisions of unelected authorities, such as the officials of a central bank, the less freedom we have. He argued that unless bureaucrats are tightly constrained by rules, democracy can turn into an authoritarian system operated through government agencies.

Now I certainly agree that it would be abhorrent to live in a society in which unelected government officials — or elected officials, for that matter — were above the law. That is why democracies need constitutions. But there is a problem with applying this reasoning to monetary policy, a problem that Simons recognized but never really resolved. In order for legislative rules and constitutions to promote a free society, they must be based on consensus. In matters in which there is no consensus, a legislative or constitutional rule that is hard to change — and that is the only kind that will work — will end up giving a special, privileged status to someone's particular point of view, placing it above all competitors'. Canadians today have seen enough of the troubles that can arise when there are deep differences over whose point of view should be enshrined in the Constitution.

If anything is clear about monetary policy, it is that this is not an area in which there exists a lot of consensus. It is an area in which there are deep differences. Because of these differences, imposing a binding rule on the Bank of Canada would do more to undermine freedom than to promote it.

Consider the Kydland-Prescott argument for rules.[25] They argue that even if the central bank is perfectly honest, competent, and well motivated, a binding rule will improve social welfare by making credible the central bank's commitment to a policy of low inflation. Others have pointed out several problems with the Kydland-Prescott analysis.[26] Yet no one seems to have noticed what I see as its main problem: namely that it assumes there is one and only one correct interpretation of economic reality, that there is a universally agreed-on definition of social welfare and a single correct model of the economy. Such assumptions are commonplace in economics, and often they are innocuous. They are fundamentally undemocratic, however, when they are used to justify imposing a binding rule on everyone in an area in which there are huge differences of opinion. Because they leave no room for disagreement, they lead to the conclusion that no one but a deranged enemy of the people could object to having the uniquely optimal policy imposed as a binding and unalterable rule. It would come as no surprise to any student of Karl Popper that an argument starting from the assumption of absolute knowledge ends up with such totalitarian conclusions.[27]

Now the Bank of Canada may not seem the embodiment of what is good about democracy. In fact, the Bank has been known to pursue extremely unpopular policies, and it has been able to do so largely because it is somewhat insulated from political pressures. Yet the Bank is ultimately responsible to the people in Parliament, through the Minister of Finance. As the Coyne affair of 30 years ago demonstrated, this responsibility does put limits on its conduct.

Furthermore, the Bank has been open to criticism and suggestion. When problems have been pointed out and a better policy has been proposed, it has admitted mistakes and changed its policies, as when it adopted monetary gradualism and again when it abandoned that approach. This willingness to learn from mistakes is the source of the unpredictable and contradictory shifts in policy that advocates of rules would like to suppress. To me, these shifts are just part of the collective trial and error process that Popper argues is the distinguishing feature of an open society.

Conclusion

To understand the theory of monetary policy, you have to see it as part of the democratic process, an adaptive process that works not by imposing order on society but by leaving people free to criticize and to suggest improvements to existing arrangements. The role of the economist in this process is to help find a better way of dealing with some of the uncertainties of economic life, not by dictating the policy that would maximize social welfare but by helping society learn from mistakes. This role may seem a humble one, but personally, I take comfort in the thought that there will be a need for economists until there are no more mistakes.

Notes

* This paper is adapted from the inaugural lecture for the Bank of Montreal Chair of Money and Finance, University of Western Ontario, London, Ontario presented September 26, 1990. Helpful comments on the original version of the lecture from Tom Kierans, David Laidler, and Bill Robson are gratefully acknowledged.

1 The Bank of Canada's G-10 weighted average measure of the Canadian exchange rate, which had assumed an average value of more than 124 in 1976, had fallen to 99 by the end of 1978.

2 See Louis Christofides, Robert Swidinsky, and David Wilton, "The Impact of the Anti-Inflation Board on Negotiated Wage Settlements," *Canadian Journal of Economics* 12 (May 1979); and Frank Reid, "The Effect of Controls on the Rate of Wage Change in Canada," *Canadian Journal of Economics* 12 (May 1979).

3 Most of this account of monetary gradualism is drawn from the detailed study by Thomas J. Courchene, *Money, Inflation, and the Bank of Canada, Volume II: An Analysis of Monetary Gradualism, 1975–1980* (Montreal: C.D. Howe Institute, 1981).

4 See Stephen J. Poloz, "Unstable Velocity and the Monetary Approach to Exchange Rate Determination," paper prepared for the Economic Research Institute, Economic Planning Agency, Tokyo, December 1984.

5 See Peter Howitt, *Monetary Policy in Transition: A Study of Bank of Canada Policy, 1982–85* (Toronto: C.D. Howe Institute, 1986), pp. 42, 43.

6 As Courchene points out, the press release of April 3, 1978 announcing an increase in the Bank Rate was significant in that it cited currency depreciation, not M1 growth, as the reason for the increase, implying a reduced commitment to the explicit goals of monetary gradualism. By the time of that press release, the Bank had been aware of and concerned about the apparent shift in the demand function for money for several quarters. (*Money, Inflation*, pp. 102ff.)

7 Charles Freedman, "Financial Innovation in Canada: Causes and Consequences," *American Economic Review Proceedings* 73 (May 1983) presents a useful account of these developments.

8 Robert E. Lucas, Jr., "Econometric Policy Evaluation," in Karl Brunner and Allan H. Meltzer, eds., *The Phillips Curve and Labor Markets*, Carnegie-Rochester series on public policy 1 (Amsterdam: North-Holland, 1976).

9 Courchene, *Money, Inflation*, pp. 69ff.

10 The difficulty of interpreting short-run empirical demand functions for money is the subject of a symposium that appeared as a special issue of *Journal of Policy Modelling* 12 (Summer 1990), edited by David Laidler.

11 David E.W. Laidler and William B.P. Robson, *Mainly Money: The Cause of Canadian Inflation*, Inflation Monitor 4 (Toronto: C.D. Howe Institute, 1990).

12 The fact that both the 1981–82 recession and the current recession were signaled by an earlier sharp decline in the rate of M1 growth also illustrates that the M1 aggregate offers information that is not contained in the broader aggregates, whose fluctuations are more nearly contemporaneous with those of the business cycle. This extra informational content of M1 has been noted in some of the empirical work published by the Bank of Canada; an example is D. Hostland, S. Poloz, and P. Storer, *An Analysis of the Information Content of Alternative Monetary Aggregates*, Bank of Canada Technical Report 48 (Ottawa: Bank of Canada, 1987).

13 See, for example, Benjamin Friedman, *Economic Stabilization Policy: Methods in Optimization* (Amsterdam: North-Holland, 1975).

14 See Karl Brunner, "Monetary Policy and Monetary Order," *Aussenwirtschaft* 39 (1984) for a succinct expression of this view.

15 For an admission that Bank of Canada policy inadvertently fueled inflation in the 1970s, see Bank of Canada, *Annual Report of the Governor 1987* (Ottawa, 1988), p. 8.

One deputy governor attributed the policy mistakes of the 1970s, at least in part, to the attempt "to achieve what turned out to be unrealistically low rates of unemployment." Charles Freedman, "Monetary Policy in the 1990s: Lessons and Challenges" (paper prepared for Monetary Policy Issues in the 1990s, economic policy symposium hosted by the Federal Reserve Bank of Kansas City, August 30 to September 1, 1989), p. 3.

16 A temporary decline in the rate of monetary expansion occurred in late 1987 and early 1988 (see Figure 3). It was largely attributable to unusually strong net sales of Canada savings bonds — which tend to draw money out of M2 and M3 — in the fall of 1987.

17 Knut Wicksell, *Interest and Prices*, originally published 1898, trans. Richard Kahn for the Royal Economics Society 1936 (reprint, New York: Augustus Kelley, 1962), especially chaps. 8–9. David Laidler, *The Golden Age of the Quantity Theory* (London: Philip Allan, forthcoming), chap. 5 presents a detailed discussion of Wicksell's views on the connection between interest rates and inflation.

The potential instability discussed in the next paragraph is commonly referred to as Wicksell's cumulative process, although many details differ substantially from Wicksell's various accounts, not all of which are mutually consistent. In particular, the present discussion relies more on the distinction between real and nominal interest rates than did Wicksell's analysis. In this respect, it follows closely the analysis of Milton Friedman, "The Role of Monetary Policy," *American Economic Review* 58 (March 1968).

18 The rational expectations analysis of a monetary policy of interest targeting, under a variety of assumptions about the workings of the macroeconomic system, is presented by Bennett McCallum, "Some Issues Concerning Interest-Rate Pegging, Price-Level Determinacy, and the Real Bills Doctrine," *Journal of Monetary Economics* 17 (January 1986).

19 This is not to say that Bank of Canada announcements are irrelevant. On the contrary, they are very relevant in foreign exchange markets, where forecasts of the Canadian exchange rate, as opposed to forecasts of the Canadian rate of inflation, are based to a large extent on expected monetary policy. It should also be noted that the failure of policies such as monetary gradualism increases people's lack of inclination to focus on Bank pronouncements when forecasting inflation.

20 The result of nonconvergence to rational expectations when the central bank controls interest rates too tightly is spelled out in detail in my "Interest Control and Nonconvergence to Rational Expectations," *Journal of Political Economy*, forthcoming.

21 Brunner, "Monetary Policy and Monetary Order."

22 For example, Milton Friedman, one of the most ardent advocates of rules, declared that Bank Governor Gerald Bouey's speech announcing the program of monetary gradualism was "the best speech I have ever heard a central banker give." Milton Friedman, remarks at the Milton Friedman Seminar, Montreal, October 2, 1975 (Montreal: C.J. Hodgson, Richard, 1975), p. 2.

23 Henceforth the term "rules" is used to refer to legislative rules. Like the previous argument, the following discussion does not apply to administrative rules.

24 His views on this and related subjects are collected in Henry Simons, *Economic Policy for a Free Society* (Chicago: University of Chicago Press, 1948).

25 Finn E. Kydland and Edward C. Prescott, "Rules Rather than Discretion: The Inconsistency of Optimal Plans," *Journal of Political Economy* 85 (June 1977).

26 For a review of some of the literature originating from the Kydland-Prescott paper, see Kenneth Rogoff, "Reputational Constraints on Monetary Policy," in Karl Brunner and Allan H. Meltzer, eds., *Bubbles and Other Essays*, Carnegie-Rochester Series on Public Policy 26 (Amsterdam: North-Holland, 1987).

27 See especially Karl Popper, *The Open Society and its Enemies*, 4th ed., rev. (London: Routledge and Kegan Paul, 1962).

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